CAN FOR BULK PRODUCTS

Field of the Invention

The present invention refers to a can made of metallic sheet, presenting a polygonal or circular cross section and which provided with an end upper lid of the type which allows multiple opening and closing operations during the progressive consumption of the bulk product stored in the can in a particulate or liquid form.

Prior Art

The cans of the type considered herein comprise a tubular body formed by one or more peripheral lateral walls, to whose lower edge is double seamed or otherwise incorporated a bottom wall, and to whose upper edge is double seamed an external peripheral edge of an annular upper wall, having an internal peripheral edge defining a median opening that gives access to the interior of the recipient and in which is configured a seat for the seating and retention of a re-closable lid usually made of metallic sheet.

In these know constructions, the annular upper wall of the can generally incorporates, in the internal peripheral edge thereof, a rib obtained by folding or bending the metallic sheet and which can assume different cross sections, but usually defining a circumferential seat presenting a cross section which is at least partially circular.

In some known constructions, such as those described in US patents 3,572,540, 5,899,352 and 6,085,934 and in Patent Applications EP 0 292 462 A3 and JP 05244141/93, the circumferential seat defined by the internal peripheral rib of the annular upper wall of the can is provided, in the lower edge region, with a skirt incorporated to said annular upper wall and projecting, with a varying inclination, to the

interior of the can.

In several constructions, such as the one defined in US patent 795,126, of 1905, the seat for the seating and retention of the can lid is defined by one or more circumferential grooves formed on the external face of the annular upper wall of the can, by deformation of the metallic sheet of the latter.

Even in the constructions, such as those defined in documents EP 0 292 462 A3 and EP 1 043 244 A1, in which the rib that defines the circumferential seat is obtained by upwardly or downwardly bending the internal peripheral edge of the annular upper wall of the can, said rib has its lower region, which is turned to the inside of the can, disposed in a plane transversal to the axis of the can and positioned below the plane of the external peripheral edge of the annular upper wall of the can.

A similar situation occurs in the constructions such as in US patent 795,126, in which the seat is defined by at least one circumferential groove, whose bottom lies in a plane situated below the plane of the external peripheral edge of the annular upper wall of the can.

In these known can constructions, the radial extension of the annular upper wall, defined between its external peripheral edge and its internal peripheral edge in which is formed the opening that gives access to the inside of the can, is provided with at least one circumferential region which, when the can is inverted, defines a barrier which impairs the free gravitational and radial flow of the bulk product still seated on the annular upper wall of the can and which is prevented from flowing toward the opening of the latter.

It is well known the difficulty the consumer has to

pour all the bulk product contained in this type of can provided with an annular upper wall. As a function of the construction of said annular upper wall which carries the seat of the lid and defines the opening for the access to the interior of the can, it is practically impossible or at least too laborious to remove all the product from the interior of the can by the simple effect of gravity. A small quantity of the product, whether in powder, granulated or liquid form tends to be retained against the annular upper wall when the can is inverted after the lid has been removed.

Objects of the Invention

By reason of the deficiency mentioned above and related to the known annular upper wall constructions of the cans for bulk products, it is a generic object of the present invention to provide a can of the type considered herein, which when opened and inverted allows the stored product which is seated against the annular upper wall to radially and gravitationally flow toward the opening of the can and outwardly from the latter.

It is a further object of the present invention to provide a can as mentioned above which presents, in the annular upper wall thereof, a seat on which is seated a lid which can be opened and hermetically re-closed multiple times during the operation of the can as a recipient for storing a product.

Disclosure of the Invention

In order to attain the above-mentioned objects, the present invention is applied to a can for bulk products, comprising: a tubular body in metallic sheet, having at least one peripheral lateral wall and one annular upper wall, presenting an external edge affixed to the peripheral lateral wall, an internal

face turned to the interior of the tubular body and an internal edge defining an opening that gives access to the interior of the can; and a lid to be removably fitted and retained in the opening of the can, in order to close it.

According to the invention, the annular upper wall of the tubular body presents any point of its internal face disposed at a height, measured in the interior of the tubular body, at minimum equal to the height of another point of said internal face which is disposed in a radially external manner, aligned and adjacent in relation to said point.

In the preferred construction, which is generally applied to a can with a circular cross section, the points of the internal face of the annular upper wall, disposed according to the same circumferential alignment concentric to the axis of the tubular body, are contained in a plane orthogonal to said axis.

The construction defined above allows the annular upper wall of the can to present its internal face without any salient or recessed element which might define a barrier that impairs the radial gravitational flow, toward the opening of the can and outwards from the latter when in an inverted position, of the stored product which is seated against the annular upper wall.

The construction proposed herein allows the annular upper wall of the can to operate as a kind of hopper which directs the product to the opening of the tubular body, when the can is inverted for pouring the powder, granulated or liquid product which is still contained inside the tubular body.

Brief Description of the Drawings

The invention will be described below, with reference to the enclosed drawings given by way of example of an

embodiment of the invention, and in which:

Figure 1 illustrates, schematically, a partial diametrical sectional exploded view of the upper portion of a can and of the respective lid, constructed according to a first embodiment of the present invention;

Figure 2 illustrates, schematically, a partial diametrical sectional view of the upper portion of a can closed by a lid;

Figure 3 illustrates, schematically, an enlarged view of part of figure 2, illustrating the profile of the annular upper wall of the can and the double seaming region between the lid and said annular upper wall;

Figure 4 is a schematic view similar to those of figures 1 and 2, but illustrating the can in an inverted position, without the lid and containing a remaining portion of the product being gravitationally poured through the opening of the annular upper wall;

Figures 5 and 6 are, respectively, views similar to those of figures 1 and 2, but illustrating the lid constructed according to a second embodiment of the present invention;

Figure 7 is an upper plan view of the lid of figures 5 and 6;

Figure 8 illustrates, schematically, an enlarged view of part of figure 6, illustrating the profile of the annular upper wall of the can and the seating region between the lid and said upper wall of the can; and

Figures 9 and 10 are cross-sectional views of the lid of the second embodiment, taken according to lines IX-IX and X-X in figure 7, respectively.

Detailed Description of the Invention

As illustrated in figures 1-4 of the enclosed drawings, the present invention is applied to a can for bulk products, in the powder, granulated or liquid

form, comprising a tubular body 10 in metallic sheet and presenting a circular cross section with a peripheral lateral wall 11, or any polygonal section with multiple peripheral lateral walls (not illustrated), the tubular body 10 being provided with an annular upper wall 12 presenting an external edge 12a which is affixed, generally by double seaming, to an upper edge 11a of the peripheral lateral wall 11 of the tubular body 10, said annular upper wall 12 being provided with an internal face 12b turned to the interior of the tubular body 10, and with an internal edge 12c defining an opening 13 to give access to the interior of the tubular body 10.

The present can further comprises a lid 20, generally made of plastic and which is configured to be removably fitted and retained in the opening 13, in order to hermetically close the latter.

According to the invention, the annular upper wall 12 presents any point of its internal face 12b disposed at a height, which is measured inside the tubular body 10, at minimum equal to the height of another point of said internal face 12b which is disposed in a radially external manner, aligned and adjacent in relation to said point.

The construction defined above allows any radial alignment of the internal face 12b of the annular upper wall 12 to take the form of a kind of slope which can be continuous or interrupted by steps disposed in planes orthogonal to the axis of the tubular body 10, which slope is inclined upwardly and toward the opening 13 of the tubular body 10, from the peripheral lateral wall 11.

In the preferred illustrated construction, the points of the internal face 12b of the annular upper wall 12, disposed according to the same circumferential

alignment concentric to the axis of the tubular body 10, are contained in a plane orthogonal to said axis, allowing that the annular upper wall 12 when applied to a tubular body 10 with a circular cross section, be defined as a revolution surface obtained by rotation of a generatrix around the axis of the tubular body 10, said generating being defined by the profile of said annular upper wall 12.

As illustrated in the figures of the drawings, the internal face 12b of the annular upper wall 12 is configured to present, along at least a portion of its radial extension, a height which increases progressively and continuously toward the opening 13. Thus, the internal face 12b of the annular upper wall 12, in principle, is presented in the form of a straight-line segment that is inclined in relation to the axis of the tubular body 10 and extending from the external edge 12a affixed to the peripheral lateral wall 11 to the internal edge 12c that defines the opening 13.

However, considering that the annular upper wall 12 is generally double seamed to the upper edge 11a of the peripheral lateral wall 11, the annular upper wall 12 has its internal face 12b presenting an external radial extension portion 12d, adjacent to the peripheral lateral wall 11 of the tubular body 10, disposed in a plane orthogonal to the axis of the tubular body 10. This external radial extension portion 12d facilitates the adaptation of the double seaming devices of the annular upper wall 12 to the peripheral lateral wall 11.

Besides the external extension portion 12d, the internal face 12b of the annular upper wall 12 further presents, preferably, an internal radial extension portion 12e, adjacent to the opening 13, disposed in a

plane orthogonal to the axis of the tubular body 10, said plane being generally parallel and disposed at a height that is slightly superior to that of the orthogonal plane in which is contained said external radial extension portion 12d of the internal face 12b of the annular upper wall 12, said external radial extension portion 12d and said internal radial extension portion 12e being interconnected by a conic portion of said internal face 12b of the annular upper wall 12.

Still according to the illustrated construction, the internal edge 12c of the annular upper wall 12 is upwardly and radially outwardly bent, in order to form a circumferential rib 15 presenting the cross section defined by at least one portion of an arc of a circle with the center in a plane P orthogonal to the axis of the tubular body 10 and which is medianly intersected by said plane P. In this construction, the lid 20 has a peripheral lateral wall 21 externally provided with a circumferential cradle 22 presenting the cross section in the form of an arc of a circle, within which is fitted the circumferential rib 15 of the annular upper wall 12, when the lid 20 is closed. The peripheral lateral wall 21 of the lid 20 has its upper section incorporating a continuous external peripheral flange 23, which is seated on the circumferential rib 15 and on an adjacent portion of the annular upper wall 12 of the can when the circumferential rib 15 is fitted in the circumferential cradle 22 of the lid 20, maintaining the latter in the closing condition of the opening 13.

As illustrated in the drawings, in the preferred embodiment of the invention, the circumferential rib 15 of the annular upper wall 12 is bent, in order to define a tubular cross section, the bending of the

internal edge 12c of the annular upper wall 12 being made so that its free end is disposed adjacent to an external face of said annular upper wall 12. This arrangement of the circumferential rib 15 with a circular tubular cross section, together with the lid 20 being constructed in plastic material, allows a resilient deformation of one or both parts to occur upon the fitting and unfitting of the lid 20 in relation to the opening 13 of the tubular body 10.

The lid 20 is preferably constructed in plastic material, having the peripheral lateral wall 21 projecting upwardly from the external edge of an annular basic wall 24, the latter being internally incorporated to a central tubular drawn portion 25 with a circular section, upwardly displaced and which is generally disposed in a coplanar way in relation to an upper region of the external peripheral flange 23. Said central drawn portion 25 facilitates the stacking of the lids 20 in the assembly lines and allows that the raise of the internal pressure existing inside a closed can results in an increase of the radial forces applied by the annular basic wall 24, and consequently by the peripheral lateral wall 21 against the circumferential rib 15, increasing the degree of tightness and retention of the lid 20.

Independently of the profile given to the annular upper wall 12, the latter has its height limited by a plane containing the upper edge 11a of the peripheral lateral wall 11 of the tubular body 10, the lid 20 being also shaped so that, in the position in which it is seated and retained in the opening 13 of the tubular body 10, it is also limited, as to the height, by said plane which contains the upper edge 11a of the peripheral lateral wall 11 of the tubular body 10.

Figures 5-10 illustrate an alternative construction

for the lid 20 illustrated in figures 1-4 of the enclosed drawings, which construction is also generally made of plastic and configured to be removably fitted and retained in said can.

According to the second construction, the lid 20 also presents a peripheral wall 21 which is provided, externally, with a circumferential cradle 22 presenting the cross section in the form of an arc of a circle, inside which is fitted the circumferential rib 15 of the upper wall 12 upon closing the lid 20 on the can, the peripheral lateral wall 21 of the lid 20 having its upper portion also incorporating an external peripheral flange 23 to be seated on the circumferential rib 15 and on the adjacent portion of the annular upper wall 12 of the can, when the lid 20 closes the opening 13.

According to the construction above, the external peripheral flange 23 is dimensioned to seat only on the circumferential rib 15, but incorporates small radial extensions 23a angularly spaced from other and which are configured to seat on the annular upper wall 12 of the can, upon closing the lid 20 on the opening 13.

In this construction, the external peripheral flange 23 further incorporates two diametrically opposite radial bridges 17, dimensioned to operate as means for connecting and articulating the ends of a pair of opposite semicircular gripping handles 28 to the external peripheral flange 23 of the lid 20, said gripping handles 28 being maintained slightly spaced from the external peripheral flange 23 along their extensions that are not incorporated to the two radial bridges 27.

Both gripping handles 28 are further medianly incorporated, through breakable radial connections

23b, to the small radial extensions 23a of the external peripheral flange 23.

Thus, when the lid 20 is found seated on the opening 13 of the tubular body 10, before the can is submitted to the first opening, the two gripping handles 28 remain in an inoperative position, illustrated in full lines in figures 5-10, in which they are disposed coplanar to each other and to the small radial extensions 23a of the external peripheral flange 23.

Upon the first opening of the can, the gripping handles 28 are medianly upwardly pulled, to a raised operative position illustrated in dashed lines in figure 5, by breaking the breakable radial connections 23b, evidencing the occurrence of a previous movement of the gripping handles 28 to the operative position and a probable previous opening of the can. During the angular movement of the gripping handles 28 between the inoperative and operative positions, they remain connected and articulated to the lid 20 by the radial bridges 27. In the raised operative position, the gripping handles 28 define a means that facilitates the manual opening of the lid by the user. The lid 20 can be re-closed, and the two gripping handles 28 will return, by resilient deformation memory, to a position coinciding with or which is very proximate to the original inoperative condition maintained until before the first resilient deformation to the operative position.

While only one way of carrying out the invention has been illustrated herein, it should be understood that changes in the form and arrangement of the component parts could be made, without departing from the constructive concept defined in the appended claims.